



## TRUCK ROUTE ACCESS EVALUATION

Bells Lane Cluster  
Louisville  
Site # 7

Report No. KTC-98-29

“Freight Movement and Intermodal Access in Kentucky”  
Project No. SPR 98-189

By

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## **1.0 Introduction**

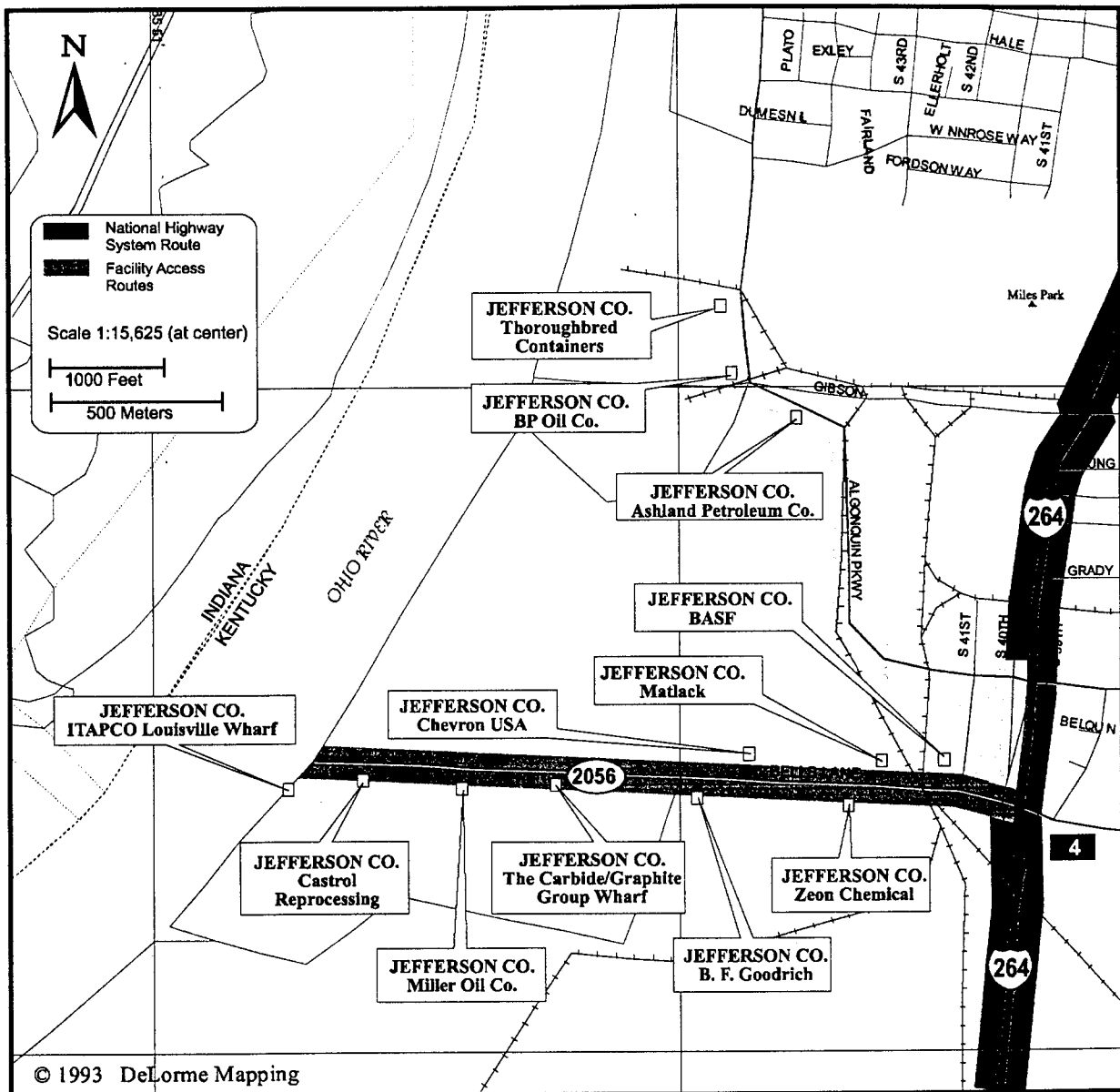
This is a study undertaken on behalf of the Kentucky Transportation Cabinet (KYTC). There are two main objectives of the Freight Movement and Intermodal Access in Kentucky Study (SPR 98-189): evaluation of the access for trucks between intermodal or other truck generating sites and the National Highway System (NHS); and furthering the understanding of freight commodity flows throughout the state. This report summarizes the access evaluation for a cluster of facilities located along Bells Lane and Algonquin Parkway in Louisville in the KIPDA Area Development District (ADD) and KYTC Highway District #5. The location of the site is shown in Figure 1. Work on other specific sites as well as the freight commodity flow task are on-going and are documented elsewhere.

The sites to be evaluated in this study were selected from two existing databases (a truck facility survey from 1994 and the intermodal facility inventory) based on ADD and KYTC Highway District planner recommendations, geographic location, distance to the NHS, and the number of trucks accessing the site. Consideration was also made for the freight type handled and transportation modes used.

The site was visited for video recording and data collection as listed in Appendix A. The following facilities are located in the area: Ashland Petroleum, BP Oil, Carbide/Graphite Group Wharf, ITAPCO Wharf, Thoroughbred Containers, Castrol Reprocessing, Miller Oil, BF Goodrich, Matlack, BASF, and Zeon Chemicals. Ashland Petroleum, BP Oil, and Thoroughbred Containers are on Algonquin Parkway, and the other facilities are located along Bells Lane as shown in Figure 1. All facilities are within one mile of I-264, which is part of the National Highway System. The surrounding area is generally urban with industrial and residential land uses.

A phone survey was conducted with facility managers early in the study process. While the overall response from industries was very good, in some cases facility managers could not be contacted or did not want to assist with the survey. In order to stay within the resources available for the project not all smaller facilities with lower truck volumes could be contacted. The phone survey found that the number of trucks per day at specific sites varies from less than 10 to 125. The most common trucks indicated were semitrailer tankers, and the largest truck indicated had a length of 53 feet. Surveys with facilities on Algonquin Parkway indicated problems with rough railroad crossings and poor conditions on 41<sup>st</sup> Street. Problems at the interchange included a blind spot on the eastbound off ramp and limited sight distance on the westbound off ramp. It was also noted that the railroad crossings on Bells Lane were occasionally blocked for up to 30 minutes at a time. The phone survey information is found in Appendix B.

**Figure 1: Location of Truck Generating Sites**



## **2.0 Truck Routes in Use**

As shown in Figure 1, trucks from these sites access the National Highway System at exit 4 of I-264 on Bells Lane (KY 2056). The Bells Lane route (shown in green) is used by trucks accessing the facilities on Bells Lane, and the Algonquin Parkway route (shown in yellow) is used by trucks traveling to and from facilities on Algonquin Parkway. To reach I-264, the trucks using Algonquin Parkway must use 41<sup>st</sup> Street to Bells Lane, or use 40<sup>th</sup> Street and 39<sup>th</sup> Street which merge with the ramps of the interchange. The layout of the interchange is shown in Figure 2. Bells Lane is a narrow two lane road which widens to four lanes at the interchange. Algonquin Parkway is a four lane undivided road. The section of 41<sup>st</sup> Street between Algonquin Parkway and Bells Lane is narrow with no pavement markings and a gravel shoulder that is used for truck parking. Both 40<sup>th</sup> and 39<sup>th</sup> Streets are one-way with no pavement markings, and are wide enough to allow parking along the street. Bells Lane is a state maintained road, and all others are local.

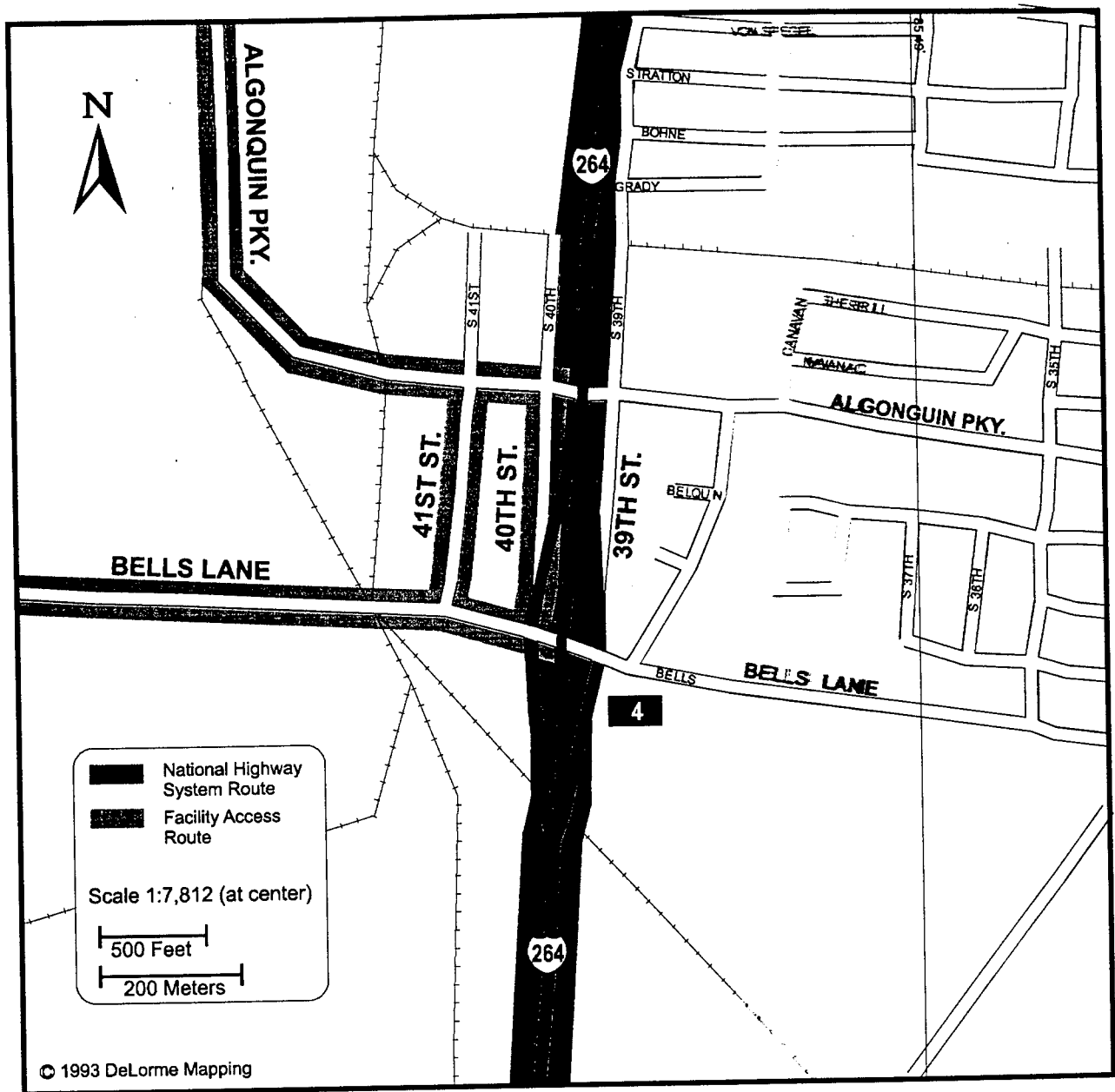
## **3.0 Route Data Collection and Evaluation**

The route features that are to be evaluated in this study are shown in Table 1 along with a brief description of the evaluation method. While some of these features require only subjective evaluation by the engineer during site inspection, others required quantitative measurement in order to label the particular point or section as “preferred,” “adequate” or “less than adequate” for truck access. The guidelines for labeling a point or section into one of these three descriptive categories are provided in both the interim and final report for this project. In several cases measurements were only taken where subjective evaluation indicated a problem might exist as “preferred” type sections and points do not contribute to an increase in the problem truck points or miles that are summed for the route (see Section 4).

### **3.1 Traffic Operations and Level of Service**

The survey of this site indicated that there were no operational problems or concerns for this site. Thus, the route is assumed to operate at an acceptable traffic level of service.

**Figure 2: Layout of I-264 Interchange**





**Table 1: Route Features and Method of Evaluation**

Feature	Methodology	Team Consensus based on Committee Meeting and Draft Report Feedback	Feature Type
Offtracking	Lane Width with formula based on wheel and axle spacing	Evaluate where observation of trucks indicates possible offtracking - use HIS data and collect in field	Point
Max. Safe Speed on a Curve	Ball Bank Indicator Reading	Evaluate complete route due to ease of data collection	Point
Grade	Speed Reduction Tables with Percent Grade and Direct Observation	Evaluate where observation of trucks indicates speed reduction occurs using HIS data and collect in field as needed	Continuous
Lane Width	HIS data and field measurement	Review complete route due to ease of data collection	Continuous
Clear Zone	Observation	Subjective evaluation	Subjective
Shoulders	HIS data and field measurement	Evaluate where HIS data is available and estimate based on observation elsewhere	Continuous
Pavement Condition	Observation	Subjective evaluation	Subjective
Truck Stopping Sight Distance	Field measurements	Measure only when observation indicates possible problem	Point
Turning Radii	Field measurements and observations of trucks	Measure only when observation indicates possible problem	Point
Accident History	Accident data files and KTC High Truck Accident Report	Do for entire route	Subjective
Intersection LOS	Traffic counts	Only where problems are indicated by facility managers	Point
Route LOS	Traffic counts and travel time studies	Only where problems are indicated by managers	Continuous
RR Crossings	Field Observation	Evaluate all level crossings	Point
Bridges	KYTC Sufficiency Rating	Evaluate all bridges	Point

### 3.2 Accident History

In 1997, the Kentucky Transportation Center studied all state maintained roads throughout Kentucky and determined average truck accident rates for different types of road sections. A critical accident rate was then calculated using the average accident rate for a specific highway type along with an assumed level of statistical significance and exposure (vehicles miles traveled). There were no sections along these routes with a truck accident rate as high as the critical rate for that particular highway type.

A summary of the accidents along the truck routes during the years of 1994, 1995 and 1996 (for all roads not just state-maintained roads) is shown in Tables 2 and 3. Although the specific accident locations were not available, the data shows that a significant number of the accidents occurred at intersections.

Truck accidents represent a significant portion of the overall accidents on Bells Lane. The 26.9% of accidents involving trucks is slightly lower than percent trucks along Bells Lane (28.9%). The 8.2% of accidents involving trucks on the Algonquin Parkway route is significantly lower than the percent trucks along that route (30.4%). The percent trucks was obtained from 1998 KYTC Vehicle Classification Counts.

**Table 2: Accident Types along Bells Lane**

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Fatal Accidents	0	0	0.0
Injury	3	1	25.0
Intersection	15	6	28.6
Total	19	7	26.9

**Table 3: Accident Types along the Algonquin Parkway Route**

	<i>Non-Truck Accidents</i>	<i>Truck Accidents</i>	<i>Percent Trucks</i>
Fatal Accidents	1	0	0.0
Injury	38	2	5.0
Intersection	67	6	8.2
Total	189	11	5.5

### **3.3 Cross Section Features**

Figures 3 and 4 illustrate the sections of the routes having different widths of lanes and shoulders. Bells Lane has “less than adequate” 10 foot lanes, and the south side of the road has a “less than adequate” 3 foot stabilized shoulder. There is no shoulder along the north side of the road. Algonquin Parkway also has “less than adequate” 10 foot lanes and no shoulders. The lanes on 41<sup>st</sup> Street have a “less than adequate” 10 foot width, and there are “less than adequate,” 3 foot shoulders. There is a section of 10 foot gravel shoulder on the east side of 41<sup>st</sup> Street, but signs indicate that it should be used for truck parking only. Both 39<sup>th</sup> and 40<sup>th</sup> Streets have a “preferred” 12 foot lane width. These one-way streets have no shoulder, but received a “preferred” rating because they are wide enough to allow parking along one side.

Bells Lane has clear zone problems in the form of poles and drainage ditches along the road. Algonquin Parkway also has problems with clear zone because of large trees very close to the roadside. There were no significant clear zone problems found on the other streets. The pavement on 41<sup>st</sup> Street had been recently patched, but was still in poor condition. The pavement on Bells Lane was in good condition, and all other route sections had fair pavement.

### **3.4 Curvature Features**

Grades are considered problematic if they cause trucks to slow down excessively. There were no such grades on these routes. Offtracking is considered a problem where a truck cannot stay in its lane while traveling a curve. There were no problematic curves found on Bells Lane. Two curves on Algonquin Parkway, near the Ashland Petroleum and BP Oil facilities, received a “less than adequate” rating due to observed offtracking. The same curves were also rated “less than adequate” for safe speed on a curve according to ball bank indicator readings. The problematic curve locations are shown on Figure 5. There were no turning radius problems identified at this site.

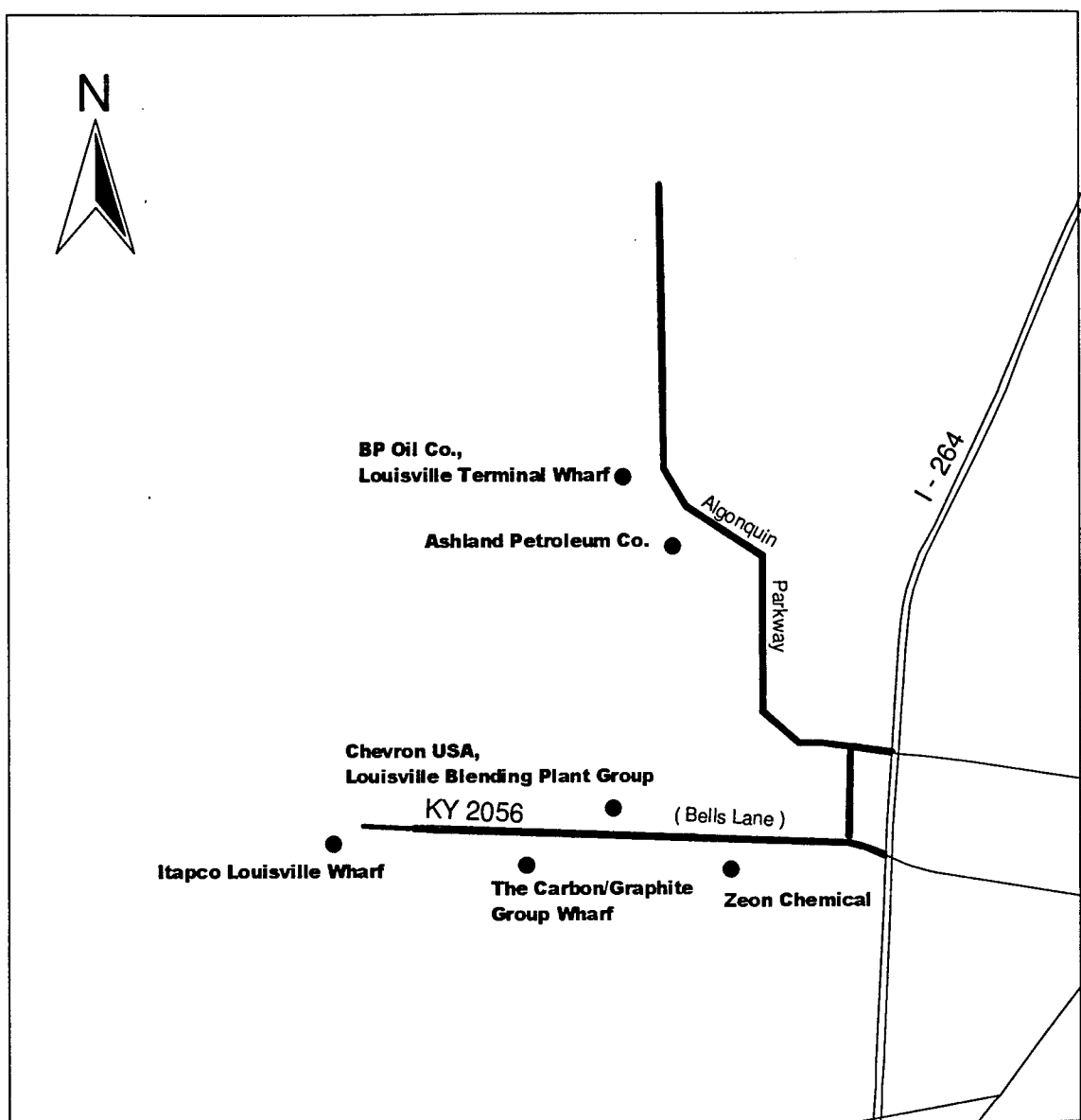
### **3.5 Railroad Crossings**

There were five railroad crossings on these routes (see Figure 1). The two crossings on Bells Lane are close enough to be seen as one large crossing, but are maintained by different companies. Both crossings received an “adequate” rating due to rough surfaces. The two crossings on Algonquin Parkway (near 41<sup>st</sup> Street and the Ashland facility) were also rated “adequate” due to rough crossing surfaces. The third Algonquin Parkway crossing is located in front of the BP Oil facility and received a “preferred” rating.

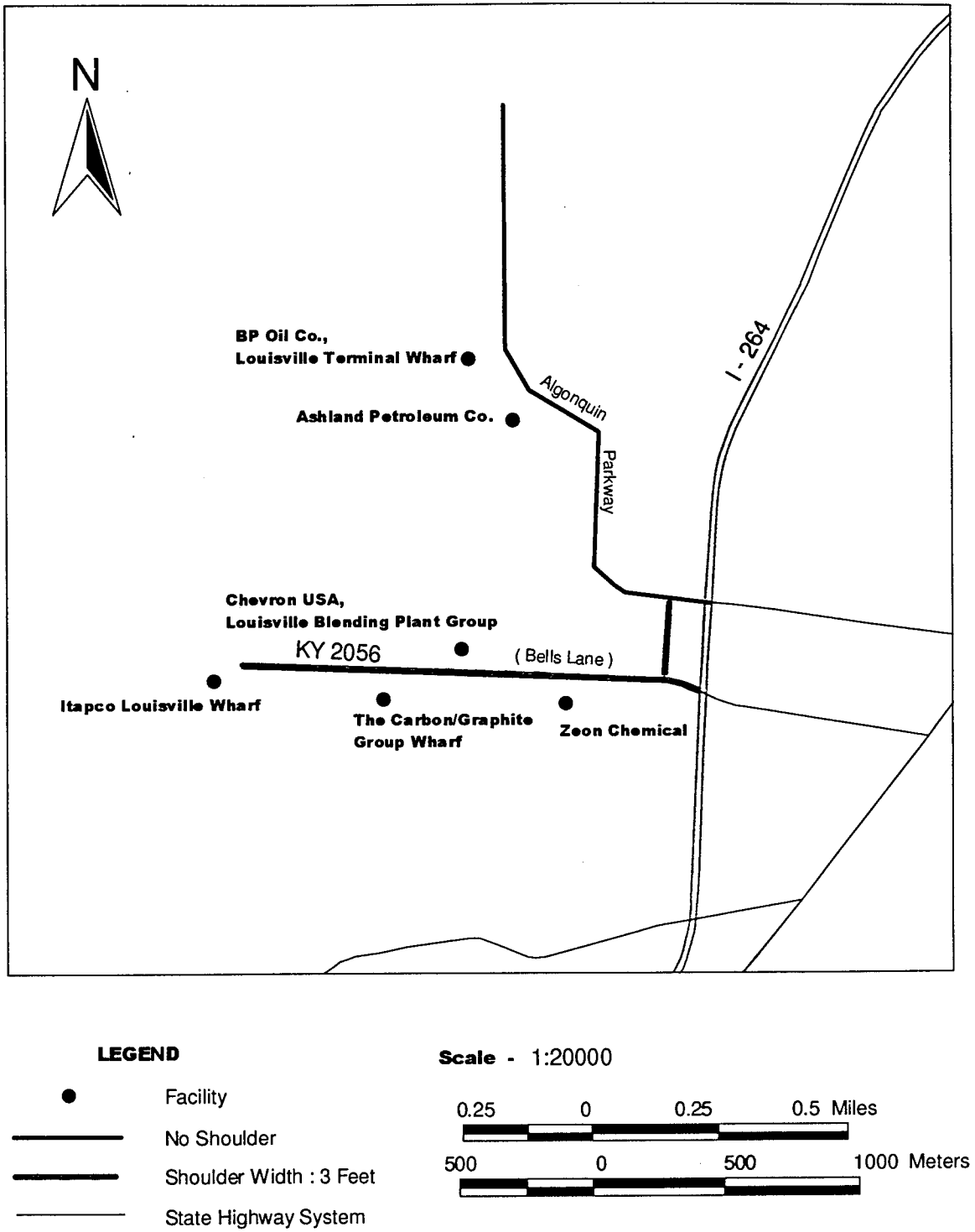
### **3.6 Bridges**

There were no bridges on these routes.

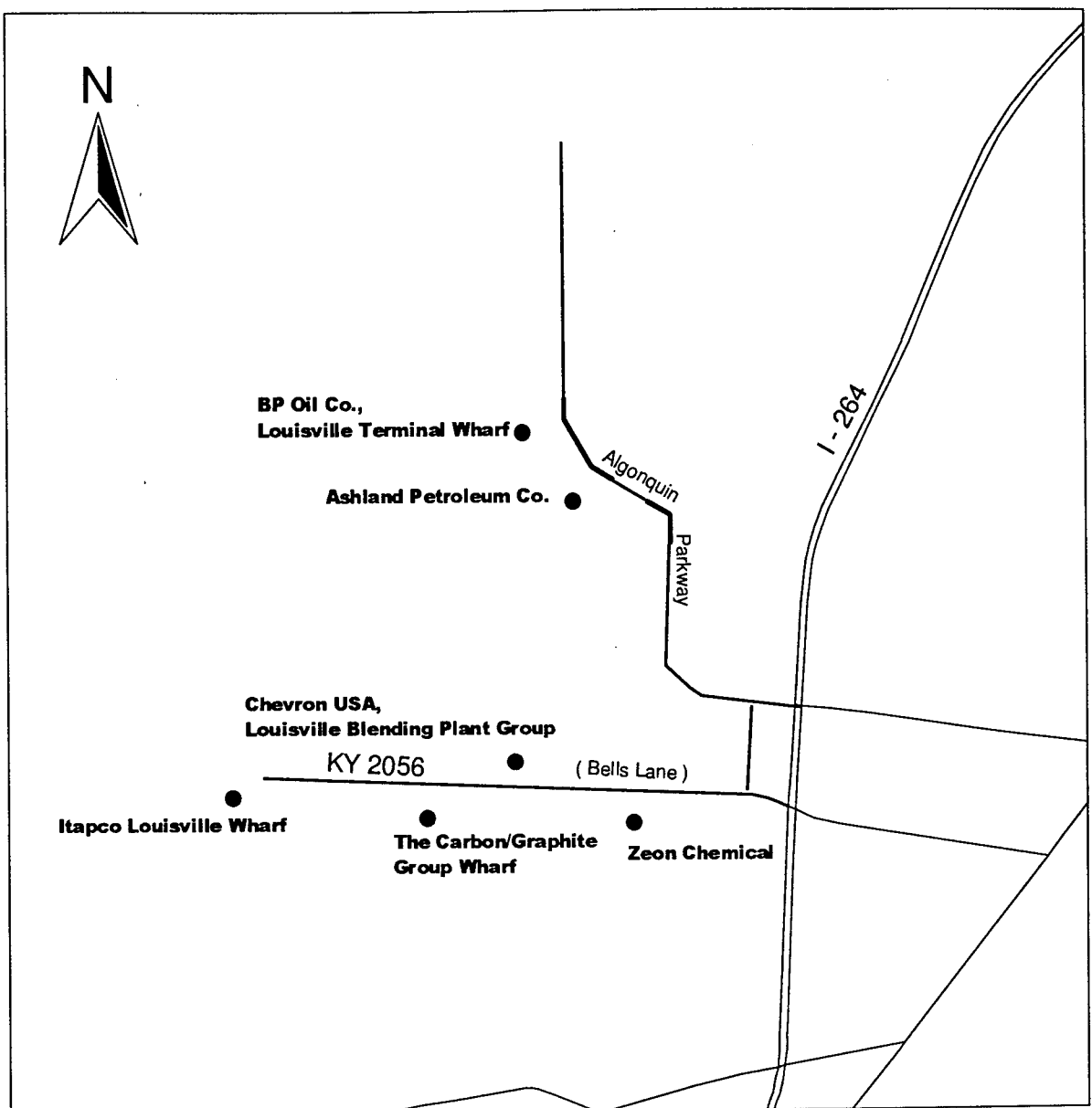
**Figure 3: Lane Widths**



**Figure 4: Shoulder Widths**



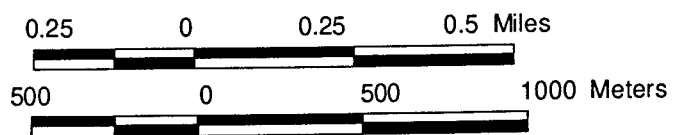
**Figure 5: Problematic Curves**



**LEGEND**

- Facility
- Offtracking and Curve Speed Problem
- Facility Access Study
- State Highway System

**Scale - 1:20000**



### 3.7 Sight Distance

No sight distance problems were observed on Bells Lane. The initial site visit found that brush was creating a sight distance problem for trucks turning from 39<sup>th</sup> Street onto Algonquin Parkway. A later site visit showed that the brush had been cleared.

### 3.8 Other Route Features

Both site visits found that dirt and brush had encroached into the travel lanes of Algonquin Parkway as shown in Figure 6. Pavement markings would be useful on 40<sup>th</sup> Street to define lanes where the ramp merges with the street. The interchange at this location is unique because the ramps merge with other streets (see Figure 2).

**Figure 6: Trees and Brush Along Algonquin Parkway**



## 4.0 Route Evaluation and Recommendations

### 4.1 Problem Truck Miles and Truck Points

In order to compare different routes to consider relative urgency of needed route improvements the features rated “preferred,” “adequate” and “less than adequate” along a route are to be normalized for the number of miles, number of points and number of trucks using the route section. On Bells Lane, three features that were evaluated quantitatively have sections or points that are considered only “adequate” or “less than adequate.” Five features were evaluated for the Algonquin Parkway route. A section or point that is considered “less than adequate” is weighted two times that of an “adequate” point or section. Less than “preferred” sections are weighted by length as well as the number of trucks passing that point. The number of trucks was obtained from 1998 KYTC Vehicle Classification Counts.

Tables 4 and 5 contain the total problem truck miles and total problem points for offtracking, curve speed, lane width, shoulders, and railroads which apply to each route. The rating of these routes relative to others evaluated will be reported in the final report.

**Table 4: Summary of Problem Truck Miles and Points on Bells Lane**

Feature	Road	Location	Points*	Length (miles)	Trucks (/day)	Truck-points	Truck-miles
Lane width	Bells	Entire length	2	1	694		1388
Shoulders	Bells	Entire length	2	1	694		1388
Railroads	Bells	East Crossing	1		694	694	
	Bells	West Crossing	1		694	694	
Total						1388	

\*1 point for “adequate” features and 2 points for “less than adequate” features (0 points for “preferred” features not shown)



**Table 5: Summary of Problem Truck Miles and Points on the Algonquin Parkway Route**

<b>Feature</b>	<b>Road</b>	<b>Location</b>	<b>Points*</b>	<b>Length (miles)</b>	<b>Trucks (/day)</b>	<b>Truck-points</b>	<b>Truck-miles</b>
<b>Lane Width</b>	Algonquin	Entire length	2	0.9	1288		2318.4
	41 <sup>st</sup> Street	Entire length	2	0.1	404		80.8
<b>Total</b>							<b>2399.2</b>
<b>Shoulders</b>	Algonquin	Entire length	2	0.9	1288		2318.4
	41 <sup>st</sup> Street	Entire length	2	0.1	404		80.8
<b>Total</b>							<b>2399.2</b>
<b>Offtracking</b>	Algonquin	Near Ashland	2		1288	2576	
	Algonquin	Near BP Oil	2		1288	2576	
<b>Total</b>						<b>5152</b>	
<b>Curve Speed</b>	Algonquin	Near Ashland	2		1288	2576	
	Algonquin	Near BP Oil	2		1288	2576	
<b>Total</b>						<b>5152</b>	
<b>Railroads</b>	Algonquin	Near 41 <sup>st</sup> Street	1		1288	1288	
	Algonquin	Near Ashland	1		1288	1288	
<b>Total</b>						<b>2576</b>	

\*1 point for "adequate" features and 2 points for "less than adequate" features (0 points for "preferred" features not shown)

## 4.2 Maintenance Improvement Locations

Some features noted during the site work could be changed to improve truck access without requiring major construction or expense. Pavement markings could be added to 40<sup>th</sup> Street at the intersection with Bells Lane. Brush could be cleared away from the roadway where it encroaches on the travel lanes or obstructs sight distance.

## 4.3 Overall Route Rating

In order to account for both the subjectively and objectively evaluated route features along truck routes throughout the state, UK engineers who studied the route and its features either during a site visit or by viewing a video of trucks using the routes have rated the overall access on a scale of 1 through 10. The interpretation for these ratings is shown in Table 6. Bells Lane received an overall rating of 3 indicating that minor improvements are required on the truck route. The Algonquin Parkway route was given an overall rating of 5, also indicating that minor improvements are required.

**Table 6: Interpretation of the Overall Route Rating**

<b>Overall Route Rating</b>	<b>Qualitative Interpretation of Rating</b>
<b>1</b>	<b>Trucks should not be using this route</b>
<b>2</b>	<b>Major construction is required to improve this route</b>
<b>3-5</b>	<b>Minor improvements are <u>required</u> on this route</b>
<b>6-8</b>	<b>Minor improvements could <u>improve</u> this route</b>
<b>9</b>	<b>Minor problems exist that do not seriously impede truck access</b>
<b>10</b>	<b>Trucks are served with reasonable access</b>

## **Appendices**

## **Appendix A: Field Site Visit Dates and Activities**

February 13, 1998 - initial site visit and video taping

April 23, 1998 - field data collection

May 29, 1998 - additional field data collection

## Appendix B: Phone Surveys Conducted with Facilities

<u>Facility ID</u>	<u>Facility Name</u>	<u>Location / City</u>	<u>County</u>	<u>ADD</u>
7	ITAPCO Wharf	Louisville	Jefferson	KIPDA

<u>Contact Name</u>	<u>Title</u>	<u>Phone</u>	<u>Fax</u>
Rick Noltemeyer		502-772-7575	502-772-2110

- Is the location of your facility on the map correct? Yes
- Our information shows about 20 trucks per day access your facility. Is that correct? *If not, fill in correct volume.* No, 7-8
- Is the truck traffic to and from your facility seasonal or mostly constant?  
Seasonal, Spring/Summer peak
- (If truck traffic is seasonal)* Is the 7-8 trucks/day for the peak season? No, 9 in peak
- What is the most common size truck operating at your facility? Semitrailer 5,000 gal. tanker
- What is the largest truck operating at your facility? Semitrailer 7,000 gal. tanker
- What type of freight or commodity is shipped, and is incoming and outgoing freight different?  
*(one may be an empty truck)*  
Fertilizer
- Does the truck traffic peak at specific times of the day? (e.g., out in the morning and return in the afternoon) Constant
- What traffic congestion and delay problems along the routes are you aware of, or feel need improvement?  

<u>Location (route segment, intersection, etc.)</u>	<u>Time and Day of Week</u>
None	
- Where do trucks at your facility go to and come from? (This may be an interstate, cities, general direction-N,S,E,W) I-264
- Do you have any other problems or concerns along the route you would like us to consider?  
Two rail spurs are blocked for 20-30 minutes once a week.  
Eastbound ramp off I-264 has blind spot for cars.
- Would you like a copy of the final report (roadway/route evaluation ???) Yes

<u><b>Facility ID</b></u>	<u><b>Facility Name</b></u>	<u><b>Location / City</b></u>	<u><b>Country</b></u>	<u><b>ADD</b></u>
7	BP Oil Company Terminal Dock	Louisville	Jefferson	KIPDA

<u><b>Contact Name</b></u>	<u><b>Title</b></u>	<u><b>Phone</b></u>	<u><b>Fax</b></u>
*Scott Kennemer Kenan Transport		502-423-4250	

1. Is the location of your facility on the map correct? Yes
2. Our information shows about 60 trucks per day access your facility. Is that correct? If not, fill in correct volume. No, 10\*
3. Is the truck traffic to and from your facility seasonal or mostly constant? Constant
4. (If truck traffic is seasonal) Is the \_\_\_\_\_ trucks/day for the peak season?
5. What is the most common size truck operating at your facility? Semitrailer 9,200 gal. tanker
6. What is the largest truck operating at your facility? Semitrailer 9,200 gal. tanker
7. What type of freight or commodity is shipped, and is incoming and outgoing freight different? (one may be an empty truck) Liquid
8. Does the truck traffic peak at specific times of the day? (e.g., out in the morning and return in the afternoon) Constant
9. What traffic congestion and delay problems along the routes are you aware of, or feel need improvement?  

<u>Location (route segment, intersection, etc.)</u>	<u>Time and Day of Week</u>
None	
10. Where do trucks at your facility go to and come from? (This may be an interstate, cities, general direction-N,S,E,W) I-264
11. Do you have any other problems or concerns along the route you would like us to consider?  
 Railroad tracks are rough.  
 Blind spot off ramp of I-264 westbound, must cross four lanes there.
12. Would you like a copy of the final report (roadway/route evaluation ???)

**NOTES/COMMENTS:**

\*BP does not own the trucks. Spoke with Mr. Kennemer of Kenan Transport. The number of trucks represents those run by Kenan Transport, not the total number accessing BP.

<u><b>Facility ID</b></u>	<u><b>Facility Name</b></u>	<u><b>Location / City</b></u>	<u><b>County</b></u>	<u><b>ADD</b></u>
7	Carbide/Graphite Group	Louisville	Jefferson	KIPDA
<u><b>Contact Name</b></u>		<u><b>Title</b></u>	<u><b>Phone</b></u>	<u><b>Fax</b></u>
Paul Thacker			502-775-4180	502-775-4064

1. Is the location of your facility on the map correct? Yes
2. Our information shows about 20 trucks per day access your facility. Is that correct? *If not, fill in correct volume.* Yes
3. Is the truck traffic to and from your facility seasonal or mostly constant?  
Constant
4. *(If truck traffic is seasonal)* Is the \_\_\_\_ trucks/day for the peak season?
5. What is the most common size truck operating at your facility? Semitrailer 40' - 45'
6. What is the largest truck operating at your facility? Semitrailer 53'
7. What type of freight or commodity is shipped, and is incoming and outgoing freight different?  
*(one may be an empty truck)*  
Calcium carbide
8. Does the truck traffic peak at specific times of the day? (e.g., out in the morning and return in the afternoon) Constant
9. What traffic congestion and delay problems along the routes are you aware of, or feel need improvement?  
Location (route segment, intersection, etc.) Time and Day of Week  
None
10. Where do trucks at your facility go to and come from? (This may be an interstate, cities, general direction-N,S,E,W) 30% - Ontario, 40% Southeast, 30% West
11. Do you have any other problems or concerns along the route you would like us to consider?  
None
12. Would you like a copy of the final report (roadway/route evaluation ???) Yes

<u><b>Facility ID</b></u>	<u><b>Facility Name</b></u>	<u><b>Location / City</b></u>	<u><b>County</b></u>	<u><b>ADD</b></u>
7	Ashland Petroleum	Louisville	Jefferson	KIPDA

<u><b>Contact Name</b></u>	<u><b>Title</b></u>	<u><b>Phone</b></u>	<u><b>Fax</b></u>
Fred McCormick		502-772-5200	502-772-5223

1. Is the location of your facility on the map correct? Yes
2. Our information shows about 125 trucks per day access your facility. Is that correct? *If not, fill in correct volume.* Yes
3. Is the truck traffic to and from your facility seasonal or mostly constant?  
Constant
4. *(If truck traffic is seasonal)* Is the 7-8 trucks/day for the peak season? No, 9 in peak
5. What is the most common size truck operating at your facility? Semitrailer 8,000 gal.
6. What is the largest truck operating at your facility? Semitrailer 80,000 lbs
7. What type of freight or commodity is shipped, and is incoming and outgoing freight different?  
*(one may be an empty truck)* In: Dry goods Out: Fuel
8. Does the truck traffic peak at specific times of the day? (e.g., out in the morning and return in the afternoon) Constant
9. What traffic congestion and delay problems along the routes are you aware of, or feel need improvement?  

<u><b>Location (route segment, intersection, etc.)</b></u>	<u><b>Time and Day of Week</b></u>
None	
10. Where do trucks at your facility go to and come from? (This may be an interstate, cities, general direction-N,S,E,W) 100 mile radius
11. Do you have any other problems or concerns along the route you would like us to consider?  
Poor conditions on 41<sup>st</sup> Street are a problem for large trucks.
12. Would you like a copy of the final report (roadway/route evaluation ???) Yes